Maryland Historical Trust

Maryland Inventory of Historic Properties number: WI-342

Name: MD 354 over Adkins Ford.

The bridge referenced herein was inventoried by the Maryland State Highway Administration as part of the Historic Bridge Inventory, and SHA provided the Trust with eligibility determinations in February 2001. The Trust accepted the Historic Bridge Inventory on April 3, 2001. The bridge received the following determination of eligibility.

MARYLAND HISTORICAL TRUST

Eligibility Recommended _____ Eligibility Not Recommended __X____

Criteria: ____A ____B ____C ____D Considerations: ___A ___B ___C ___D ___E ___F ___G __None

Comments: Demolished in MD Delete in 2002

Reviewer, OPS: _Anne E. Bruder_____ Date: __3 April 2001____

Reviewer, NR Program: __Peter E. Kurtze_____ Date: __3 April 2001____

MARYLAND INVENTORY OF HISTORIC BRIDGES
HISTORIC BRIDGE INVENTORY
MARYLAND STATE HIGHWAY ADMINISTRATION/
MARYLAND HISTORICAL TRUST

MHT No. WI-342

SHA Bridge No. 22020 **Bridge name** Maryland Route 354 (Willards Whiton Road) over Adkins Pond

LOCATION:
Street/Road name and number [facility carried] Maryland Route 354 (Willards Whiton Road)

City/town Powellville **Vicinity** X

County Wicomico

This bridge projects over: **Road**____ **Railway**_____ **Water** X **Land** ____

Ownership: **State** X **County** _____ **Municipal** _____ **Other** _____

HISTORIC STATUS:
Is the bridge located within a designated historic district? **Yes** _____ **No** X
National Register-listed district ____ **National Register-determined-eligible district** __
Locally-designated district _____ **Other** _____

Name of district _____

BRIDGE TYPE:
Timber Bridge X:
Beam Bridge _____ **Truss -Covered** ___ **Trestle** ____ **Timber-And-Concrete** X

Stone Arch Bridge _____

Metal Truss Bridge _____

Movable Bridge ____:
Swing _____ **Bascule Single Leaf** __ **Bascule Multiple Leaf** _____
Vertical Lift _____ **Retractile**_____ **Pontoon** _____

Metal Girder_____:
Rolled Girder _____ **Rolled Girder Concrete Encased** _____
Plate Girder _____ **Plate Girder Concrete Encased** _____

Metal Suspension _____

Metal Arch _____

Metal Cantilever _____

Concrete _____:
Concrete Arch_____ **Concrete Slab** ____ **Concrete Beam** ___ **Rigid Frame** _____
Other _____ **Type Name** _____

DESCRIPTION:

Setting: Urban _____ **Small town** _____ **Rural** X_____

Describe Setting:

Bridge No. 22020 carries Maryland Route 354 (Willards Whiton Road) over Adkins Pond in Wicomico County. Maryland Route 354 runs north-south and Adkins Pond flows southeast to the Pocomoke River. The bridge is located in the vicinity of Powellville, and is surrounded by a pond, trees, and some residences.

Describe Superstructure and Substructure:

Bridge No. 22020 is a three-span, two-lane, composite timber and concrete bridge. The bridge was originally built in 1937. The bridge underwent minor repairs, including splice repair to several piles and cap channelization in 1994. The structure is 21.5 meters (70.5 feet) long and has a clear roadway width of 7.3 meters (24 feet); there are no sidewalks. The out-to-out width is 8.5 meters (27.9 feet). The superstructure consists of two timber beams which support a composite timber and concrete deck and reinforced concrete rails. The concrete deck is 5.1 centimeters (2 inches) thick and it has a bituminous wearing surface. The structure has a reinforced concrete rail with square posts, cyma curve endposts, and two square horizontal rails. The posts and endposts have Art Deco detailing. The roadway approaches have been paved. A painted number on the endpost identifies the bridge. The substructure consists of two timber abutments, and two 6-pile timber bents with cross-bracing spaced at 6.1 meter (20 foot) intervals. There are no wingwalls. The bridge is posted for 23.5 tonnes (26 tons) single unit and 36.3 tonnes (40 tons) combination unit, and has a sufficiency rating of 31.3.

According to the 1997 inspection report, this structure was in fair condition with rot and deterioration of the timber substructure members, including the cross braces, piles, and abutments. The asphalt wearing surface has longitudinal, transverse and map cracking, and is somewhat rutted. Also, the concrete railing is cracking and scaling.

Discuss Major Alterations:

A few piles in bent 2 have been repaired with splices, while the rest are in poor condition. Both the abutment caps and the bent caps were channelized in 1994.

HISTORY:

WHEN was the bridge built: 1937
This date is: Actual X **Estimated** _____
Source of date: Plaque _____ **Design plan** X **County bridge files/inspection form** _____
Other (specify) : State Highway Administration bridge forms/inspection reports

WHY was the bridge built?

The bridge was constructed in response to the need for a more efficient transportation network and increased load capacity.

WHO was the designer?

State Roads Commission

WHO was the builder?

State Roads Commission

WHY was the bridge altered?

The bridge was altered to ensure its structural integrity.

Was this bridge built as part of an organized bridge-building campaign?

The bridge was constructed by the State, as part of a campaign to improve Tidewater highways and crossings over bodies of water during the late 1930s.

SURVEYOR/HISTORIAN ANALYSIS:

This bridge may have National Register significance for its association with:
A - Events _____ B- Person _____
C- Engineering/architectural character X

The Maryland Historical Trust determined Bridge No. 22020 ineligible in April 1992, stating that it was a common type of bridge with no particular engineering significance. However, it is our recommendation that the eligibility of the bridge be reassessed under Criterion C, as a significant example of composite timber and concrete construction. The structure has a high degree of integrity and retains such character-defining elements of the type such as timber bents and cross-bracing, and concrete rails. Built in 1937, the bridge is an early example of the State Road Commissions use of the composite timber and concrete construction method patented in 1935. This bridge was one of three composite timber and concrete bridges built in Wicomico County by the Bridge Division during the 1937 to 1938 time period. Bridge No. 22005, another of the original three bridges, has been replaced by a modern bridge. The composite timber and concrete deck consists of a laminated timber deck supporting a concrete deck which interlocks with the timber base so the combination functions as a unit. This bridge had considerable technological significance at the time it was developed for its greater strength and durability over timber.

Was the bridge constructed in response to significant events in Maryland or local history?

The earliest bridges built in North America were timber bridges. According to one account, European settlers at first utilized the bridges constructed by the Native American populations, which consisted of tied timbers laid across up-turned forked tree trunks (American Association of State Highway Officials 1953: 19). This design was adopted by the settlers, who then modified the design by hewing the upper portions of the timbers to provide a flat surface and by adding a handrail to one side (American Society of Civil Engineers 1976: 143). Where crossings exceeded the length of the available timber, short spans were joined and supported on wood piles or on timber cribs filled with earth or stone. In fact, the earliest recorded bridge built by European settlers in America was most likely this type of design. Constructed in 1611 on James Towne Island, Virginia, this timber bridge extended approximately 200 feet into the water and provided docking facilities in the 12 foot deep channel (American Association of State Highway Officials 1953: 19).

The combination of timber with other materials began with the invention of the Howe truss in 1840. William Howe patented a truss which utilized iron verticals as tension members and wood diagonals as compression members. The Howe truss became a standard of railroad bridge design. By the 1860s, the problem of wood deterioration was under better control with the invention of pressure creosote treatments, which extended the life of the wood members. Timber pile bent structures

remained popular, in particular in tidal areas, into the twentieth century. These were most often used in combination with concrete.

Timber bridges continued to be constructed in the United States during the twentieth century. A significant technological development of the 1930s permitted construction of timber-concrete composite structures, featuring decks utilizing both timber and reinforced concrete. The 1975 American Society of Civil Engineers Design Guide and Commentary on Wood Structures offered the following description of composite decks of timber and concrete:

> Composite timber-concrete decks are commonly used in bridge construction. Construction is such that timber carries most of the tension forces. Composite construction is of two basic types, T-beams and slab decks.... Composite T-beam sections consist of timber stringers, which form the stem, and concrete slab for the flange area. Notches are cut into the top edge of the stringers to resist horizontal shear and mechanical fasteners are driven into the top to prevent vertical separation so that the two components perform integrally. Stresses due to temperature changes must be considered in the concrete section.
>
> Composite slabs consist of nominal 2-inch lumber, usually nailed-laminated with the wide faces vertical, and a concrete section cast monolithically in place. Grooves are formed by using alternate laminations that differ in width by 2 inches or by fabricating panels with a 2-inch offset between laminations. Horizontal shear is resisted by grooves cut into the projecting laminations or by metal shear plates. Transverse joints in the timber portion are made by dapping or cutting alternate laminations to a different length to provide finger joints. The concrete slab should be reinforced for temperature stress and for negative bending stresses when the deck is continuous over a support. No falsework or extensive forming is necessary with this construction (American Society of Civil Engineers 1975:372-73).

The timber-concrete composite slab type of bridge construction was pioneered in the United States by James F. Seiler and the American Wood-Preservers Association between 1932 and 1935. The latter organization's 1935 patent for "composite wood and concrete construction" became the basis for such technology.

Such timber-and-concrete composite structures were evidently introduced in Maryland by the State Roads Commission engineers, who kept abreast of early twentieth century trends in composite bridge design. In the 1937-1938 *Report of the State Roads Commission*, Bridge Division Chief Engineer Walter C. Hopkins acknowledged professional interest in such structures:

> The bridges constructed have been varied, with miscellaneous types and of different materials. Bridges have been built of concrete, steel, timber, or stone, or combinations thereof. Careful study is given the employment of those materials most satisfactorily adapted to the structure in question. Balance, proportion and treatment that will result in simplicity, gracefulness and pleasing appearance are always considered and sought by the designer (State of Maryland, State Roads Commission 1938:71).

The Bridge Division's earliest timber-and-concrete composite bridges were built in 1937-1938 in Tidewater Maryland. Three such bridges were constructed in Wicomico County, and one each in Calvert, St. Mary's, Queen Anne's, Kent, and Caroline counties. Pictured in the 1937-1938 State Roads Commission report, the longest such bridge was "a timber and concrete composite bridge of twelve 20-foot spans, providing a clear roadway of 26 feet, and two 3-foot, 1-inch sidewalks, over

Tony Tank Pond, on the road from Salisbury to Princess Anne near Salisbury, Wicomico County" (State of Maryland, State Roads Commission 1938:83).

Subsequent State Roads Commission reports refer to additional timber-concrete composite bridges constructed under state authority between 1939 and 1960, primarily at Tidewater (Coastal Plain) sites on the Eastern Shore and in Southern Maryland (State of Maryland, State Roads Commission 1939:71; 1943:45). In 1947, Bridge Division engineers observed that "the development of the composite use of timber and concrete has permitted the design of economical structures with the general appearance from the roadway of a much more costly bridge" (State of Maryland, State Roads Commission 1947:53).

When the bridge was built and/or given a major alteration, did it have a significant impact on the growth and development of the area?

There is no evidence that the construction of this bridge had a significant impact on the growth and development of this area.

Is the bridge located in an area which may be eligible for historic designation and would the bridge add to or detract from the historic/visual character of the potential district?

The bridge is located in an area which does not appear to be eligible for historic designation.

Is the bridge a significant example of its type?

The bridge is a good example of the State Roads Commission bridge plans of the late 1930s using composite timber and concrete technology. It is one of the three earliest composite timber and concrete bridges built by the State Roads Commission Bridge Division in Wicomico County.

Does the bridge retain integrity of important elements described in Context Addendum?

The bridge retains the character-defining elements of its type, as defined by the Statewide Historic Bridge Context, including timber bents with cross-bracing, concrete rails, and composite timber and concrete deck, however some deterioration is evident.

Is the bridge a significant example of the work of a manufacturer, designer, and/or engineer?

This bridge is a significant example of the work of the State Roads Commission in the late 1930s.

Should the bridge be given further study before an evaluation of its significance is made?

No further study of this bridge is required to evaluate its significance.

BIBLIOGRAPHY:

County inspection/bridge files _____ **SHA inspection/bridge files** X
Other (list):

Ketchum, Milo S.
1908 *The Design of Highway Bridges and the Calculation of Stresses in Bridge Trusses.* The Engineering News Publishing Co., New York.

1920 *The Design of Highway Bridges of Steel, Timber and Concrete*. Second edition. McGraw-Hill Book Company, New York.

Lay, Maxwell Gordon
1992 *Ways of the World: A History of the World's Roads and of the Vehicles That Used Them*. Rutgers University Press, New Brunswick, New Jersey.

Luten, Daniel B.
1912 Concrete Bridges. *American Concrete Institute Proceedings* 8:631-640.

1917 *Reinforced Concrete Bridges*. National Bridge Company, Indianapolis, Indiana.

Maryland State Roads Commission
1930a *Report of the State Roads Commission for the Years 1927, 1928, 1929 and 1930*. State of Maryland, State Roads Commission, Baltimore.

1930b *Standard Plans*. State of Maryland, State Roads Commission, Baltimore.

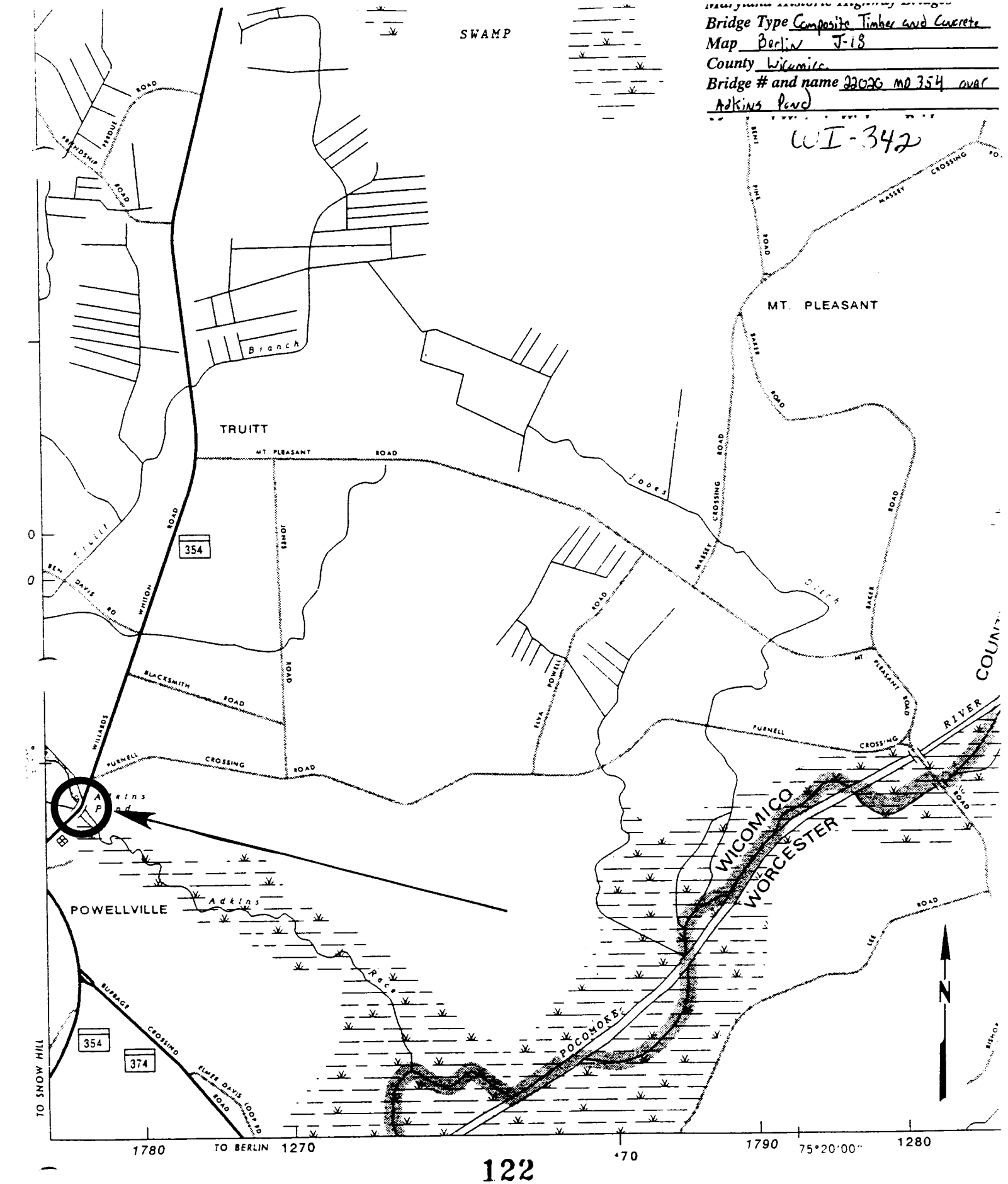
P.A.C. Spero and Company and Louis Berger and Associates
Historic Highway Bridges in Maryland: Historic Context Report. Prepared for the Maryland State Highway Administration.

Taylor, Frederick W., Sanford E. Thompson, and Edward Smulski
1939 *Reinforced-Concrete Bridges with Formulas Applicable to Structural Steel and Concrete*. John Wiley & Sons, Inc., New York.

Tyrrell, H. Grattan
1909 *Concrete Bridges and Culverts for Both Railroads and Highways*. The Myron C. Clark Publishing Company, Chicago and New York.

SURVEYOR:

Date bridge recorded 7/21/97
Name of surveyor Caroline Hall/Susan Taylor
Organization/Address P.A.C. Spero & Co., 40 W. Chesapeake Avenue, Suite 412 Baltimore, MD 21204 **Phone number** (410) 296-1635 **FAX number** (410) 296-1670



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LEGEND

- Armory
- Camping Facility
- College (Junior)
- College/University
- Md. Dept. of Agriculture Farmers Market
- Fire/Rescue
- Garage/SHA/County/Municipal
- Hospital
- Hospital w 24hour
- Motor Vehicle Administration
- Park and Ride Location
- Picnic Site
- Police Station
- Rest Area with Restro
- School
- Shopping Center/Mall
- VEIP Station
- Welcome Centers

BERLIN
MAP N(

Attachment 4

MARYLAND HISTORICAL TRUST
NR-ELIGIBILITY REVIEW FORM

WI-347

Property Name: Bridge No. 22020

Address: MD 354 over Adkins Pond, Powellville, Wicomico County, Maryland

Owner: SHA

Tax Parcel Number: N/A Tax Map Number: N/A

Project: No. WI7035180 Agency: SHA

Site visit by SHA___ Staff: no yes Name _____ Date N/A

Eligibility recommended No Eligibility **not** recommended X

Criteria: ___A ___B ___C ___D Considerations: ___A ___B ___C ___D ___E ___F ___G ___None

Is property located within a historic district? X no ___ yes Name of district:

Is district listed? N/A no ___ yes Documentation on the property/district is presented in: Historic Bridge Inventory

Description of Property and Eligibility Determination

This structure is not eligible for listing in the National Register individually as a bridge due to lack of integrity. Bridge No. 22020 is a six-span, two-lane composite timber and concrete structure which was determined ineligible for inclusion in the historic bridge inventory by the Interagency Bridge Committee on August 9, 2000 because the timber pile bents are in a very deteriorated state, with 80% requiring replacement. In 1992, repairs were done to the structure, which included splicing five of the timber piles and adding steel channels to the pier and abutment caps. These repairs, however, did not eliminate the posting. According to the latest inspection report from June of 1999, the structure has several timber stringers in each span that show extensive rot. Some stringers are missing and there is evidence of termite damage. The timber piles that were not repaired in 1992 are in poor condition with areas of section loss near the mud line. There is some undermining at the north abutment.

Prepared by: SHA Architectural and Bridge Historian Rita M.Suffness,

MARYLAND HISTORICAL TRUST REVIEW

Eligibility recommended ____ **Eligibility not recommended** X

Criteria: ___A ___B X C ___D **Considerations:** ___A ___B ___C ___D ___E ___F ___G ___None

Comments:

Reviewer, Office of Preservation Services _____ **Date** _____

Reviewer, NR program _____ **Date** 11/16/00

WI-342

PRESERVATION VISION 2000; THE MARYLAND PLAN
STATEWIDE HISTORIC CONTEXTS

I. Geographic Region:

___X_ Eastern Shore	(all Eastern Shore counties, and Cecil)
____ Western Shore	(Anne Arundel, Calvert, Charles, Prince George's and St. Mary's)
_____Piedmont	(Baltimore City, Baltimore, Carroll, Frederick, Harford, Howard, Montgomery)
_____ Western Maryland	(Allegany, Garrett and Washington)

II. Chronological/Developmental Periods:

_____ Rural Agrarian Intensification	_____A.D. 1680-1815
_____ Agricultural-Industrial Transition	_____A.D. 1815-1870
_____ Industrial/Urban Dominance	_____A.D. 1870-1930
__X__ Modern Period	__X_A.D. 1930-Present
_____ Unknown Period (___ prehistoric	___ historic)

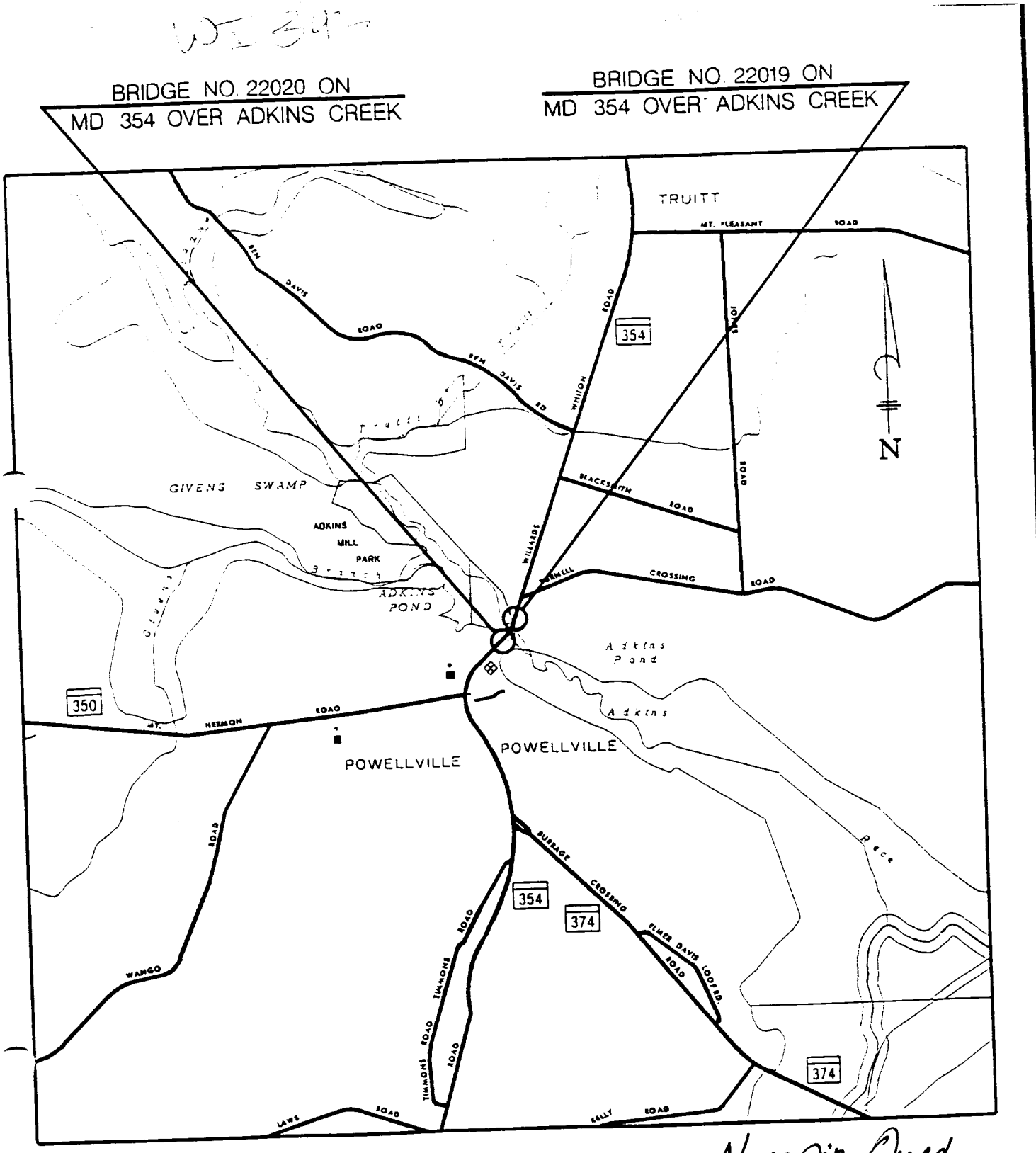
III. Historic Period Themes:

_____ Agriculture
_____Architecture, Landscape Architecture, and Community Planning
_____ Economic (Commercial and Industrial)
_____ Government/Law
_____ Military
_____ Religion
_____ Social/Educational/Cultural
__X__ Transportation

IV. Resource Type:

Category: _Structure_____
Historic Environment: __Rural_____
Historic Function(s) and Use(s): _Transportation_____
Known Design Source: _SHA_____

Attachment 2



WICOMICO COUNTY Ninepin Quad.

INDIVIDUAL PROPERTY/DISTRICT
MARYLAND HISTORICAL TRUST
INTERNAL NR-ELIGIBILITY REVIEW FORM

Property/District Name: Bridge #22020 Survey Number: WI-342

Project: MD354 over Adkins Pond, Wicomico County Agency: SHA

Site visit by MHT Staff: X no ___ yes Name _____ Date _____

Eligibility recommended ____ Eligibility not recommended X

Criteria: ___A ___B X C ___D Considerations: ___A ___B ___C ___D ___E ___F ___G ___None

Justification for decision: (Use continuation sheet if necessary and attach map)

Based on the information provided by SHA, Bridge #22020, a 1937 timber and concrete slab structure with three spans, does not meet the National Register criteria for individual listing. It is a common bridge type of no particular engineering significance. Furthermore, the bridge is not located in any known district.

Documentation on the property/district is presented in: Project File

Preparedby: RitaSuffness

Elizabeth Hannold April 22, 1992
Reviewer, Office of Preservation Services Date

NR program concurrence: X yes ___ no ___ not applicable

[signature] 23 Apr 92
Reviewer, NR program Date

DT

Survey No. WI-342

MARYLAND COMPREHENSIVE HISTORIC PRESERVATION PLAN DATA - HISTORIC CONTEXT

I. Geographic Region:

X	Eastern Shore	(all Eastern Shore counties, and Cecil)
___	Western Shore	(Anne Arundel, Calvert, Charles, Prince George's and St. Mary's)
___	Piedmont	(Baltimore City, Baltimore, Carroll, Frederick, Harford, Howard, Montgomery)
___	Western Maryland	(Allegany, Garrett and Washington)

II. Chronological/Developmental Periods:

___	Paleo-Indian	10000-7500 B.C.
___	Early Archaic	7500-6000 B.C.
___	Middle Archaic	6000-4000 B.C.
___	Late Archaic	4000-2000 B.C.
___	Early Woodland	2000-500 B.C.
___	Middle Woodland	500 B.C. - A.D. 900
___	Late Woodland/Archaic	A.D. 900-1600
___	Contact and Settlement	A.D. 1570-1750
___	Rural Agrarian Intensification	A.D. 1680-1815
___	Agricultural-Industrial Transition	A.D. 1815-1870
___	Industrial/Urban Dominance	A.D. 1870-1930
X	Modern Period	A.D. 1930-Present
___	Unknown Period (___ prehistoric	___ historic)

III. Prehistoric Period Themes:

___	Subsistence
___	Settlement
___	Political
___	Demographic
___	Religion
___	Technology
___	Environmental Adaption

IV. Historic Period Themes:

___	Agriculture
X	Architecture, Landscape Architecture, and Community Planning
___	Economic (Commercial and Industrial)
___	Government/Law
___	Military
___	Religion
___	Social/Educational/Cultural
___	Transportation

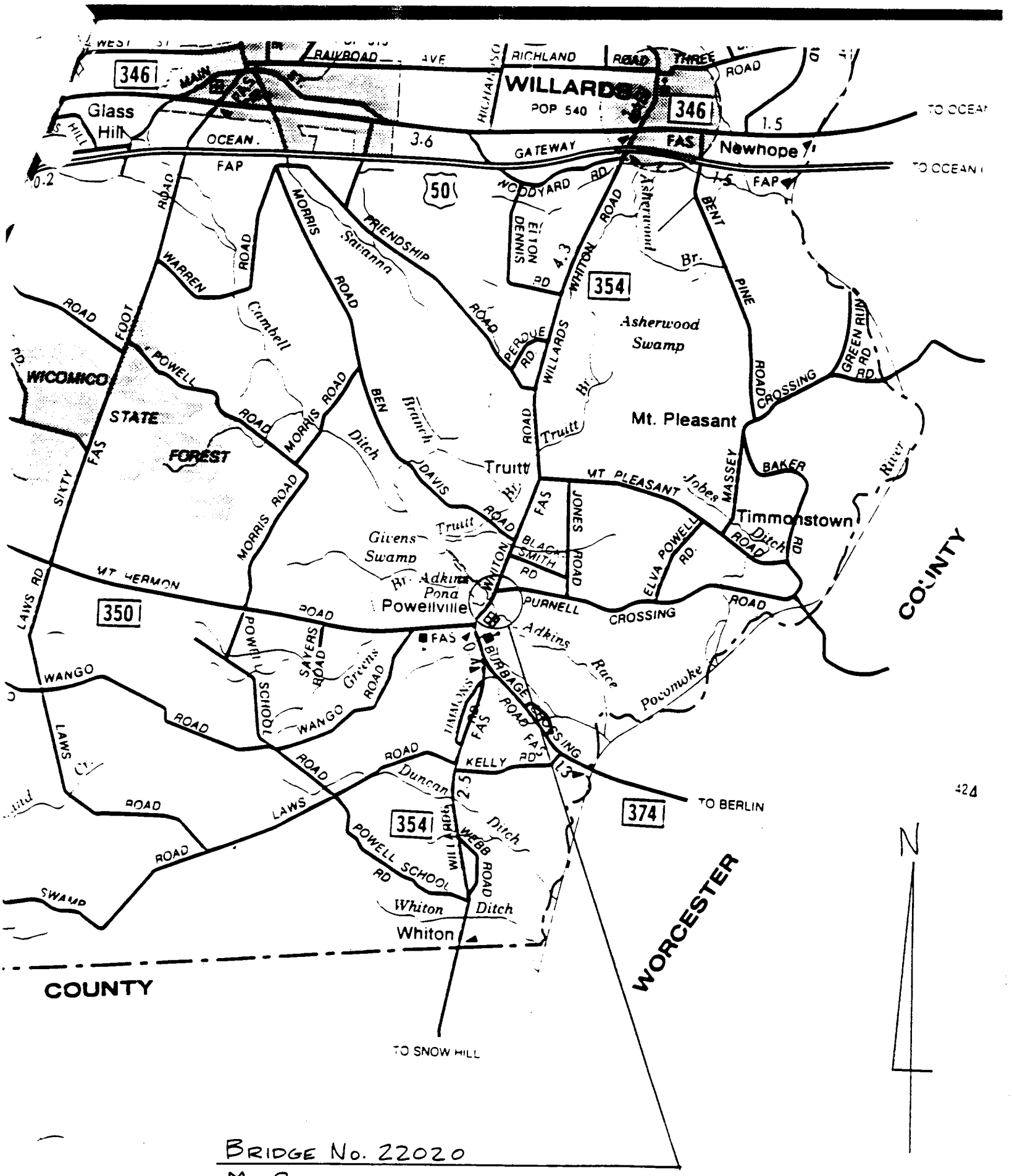
V. Resource Type:

Category: Structure

Historic Environment: Rural

Historic Function(s) and Use(s): transportation

Known Design Source: unknown



BRIDGE No. 22020

MD. RTE. 354 OVER ADKINS POND

WI-342